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Entrepreneurship and Regional Development

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Abstract

This chapter offers a review on modern entrepreneurship analysis, against the background of regional development. After a conceptual discussion on the importance and the measurement of entrepreneurship, the contribution discusses success factors and determinants of entrepreneurships. Next, focus is laid on the geography of entrepreneurship, while also due attention is paid to the relevance of networks for modern entrepreneurship. The chapter concludes with some retrospective and prospective remarks.

1 Introduction

It is widely recognised that the region has become a fundamental basis of economic and social life. The national level of observation, though still important, is no longer the uniquely privileged point of entry to our understanding of economic development and all the more so given the fact that the barriers between national economies are – in certain respects – breaking down, at least in Europe (Scott and Storper, 2003).

Regional economics has in the past decades made a successful attempt to uncover the complexities of the modern space-economy. It has led to important integrations of scientific perspectives, such as an integration of agglomeration theory and location theory, trade theory and welfare theory, or growth theory and entrepreneurship (including industrial organisation). The blend of rigorous economic analysis and geographical thinking has furthermore induced a bridge between two traditionally disjoint disciplines, while this synergy has laid the foundations for innovative scientific cross-fertilisation of both a theoretical and applied nature in the important domain of regional development. The region has become a natural fruitful anchor point for an integrated perspective on the dynamics in the space-economy, such as regional development in the context of changing labour conditions, or spatial innovation in the context of metropolitan incubator conditions (see Florida, 2002).

There is clearly a wealth of literature on regional convergence/divergence and on the factors determining structural disparity. In the past decades we have also witnessed the rise of many applied studies (see e.g., Kormendi and Meguire, 1985; Barro, 1991; Abreu, 2005), in which extensive databases were analyzed in a comparative perspective.

In light of the previous observations, regions face two imperatives in a market-driven world. First, they have to be concerned with socio-economic welfare notably employment. Job creation, an important indicator of economic growth, is central to the wealth-creating process of a regional economy. The second imperative is the ability to develop the economy. Development includes two interrelated processes: structural change and productivity improvement (Malecki, 1997a). These processes take place in a multi-faceted force field.

Regional development manifests itself as a spatially uneven change in a system of regions. Regional divergence – rather than regional convergence – is a usual phenomenon that has attracted a thorough attention of both the research community and policy agencies. The standard neoclassical view of regional growth would predict that low-wage regions would acquire productive investments from high-wage regions and/or export cheap labour to these areas. The market system would then in the longer run lead to an equalisation of factor payments, so that in the final equilibrium convergence

among regions would occur. In reality, this simplified model is subjected to many restrictive assumptions (full mobility, absolute cost differences, no institutional inertia, complete foresight on profitable investments, constant returns to scale), so that an equilibrium may be very hard to achieve. Regional change is at the end the result of entrepreneurial activity in which innovations (new or improved products and processes, new management styles, locations) are key factors.

Entrepreneurship has acquired central importance among the processes that affect regional economic change. Entrepreneurs are essential actors of change, and they can act to accelerate the creation, diffusion and application of new ideas. In doing so, they not only ensure the efficient use of resources but also take initiatives to exploit business opportunities (OECD, 1998). A central reason for the interest by policy makers in entrepreneurship is its apparent capacity – based on US experience (see OECD, 1989) – to create, directly and indirectly, employment and wealth. An important indication of the significance now attached to entrepreneurship is the OECD study on *Fostering Entrepreneurship* to increase economic dynamism by improving the environment for entrepreneurial activity (see OECD, 1998).

This chapter makes a modest attempt to review the literature on entrepreneurship. It is not a literature on a phenomenon that has reached a mature equilibrium, but as one which is still vigorously developing. Clearly, to review such an expanding field constitutes an almost impossible task, at least for what concerns completeness of coverage. The chapter is organised as follows. The section that follows starts with discussing methodological and technical problems associated with research on entrepreneurship. Section 3 continues to derive some major factors that may explain the level of entrepreneurship, while Section 4 provides a few observations on the spatial aspects of entrepreneurship. Section 5 then calls attention for entrepreneurship in a network economy, while a final section offers some respective remarks. .

2 Definitions and Measurement of Entrepreneurship

Entrepreneurship is a phenomenon that takes several forms and appears in small and large firms, in new firms and established firms, in the formal and informal economy, in legal and illegal activities, in innovative and traditional concerns, in high-risk and low-risk undertakings, and in all economic sectors (OECD, 1998). Apparently, entrepreneurship is a multi-faceted phenomenon that can be viewed from different angles. Entrepreneurship has been a topic of long-standing concern in economics, but there remains little consensus on the concept of entrepreneurship (see Hébert and Link, 1989).

Different authors have stressed different facets of entrepreneurship. Schumpeter (1934), for example, emphasised the creative component. For Schumpeter the creativity of entrepreneurship lies in the ability to perceive new economic opportunities better than others do, not only in the short term as arbitrageurs, but also in the long term as fillers of innovative niches (Suarez-Villa, 1989). While in Schumpeter's concept risk-taking is not a definitional component, Knight (1921) emphasised the entrepreneur's role as dealing with risk in a context in which entrepreneurship is separable from the control of the firm. More recently, Schultz (1980) has chosen to define entrepreneurship as the ability to deal with disequilibria rather than the ability to deal with uncertainty. Risk does not enter prominently into this concept of entrepreneurship. In his view, definitions of entrepreneurship which are uncertainty-based cannot logically relegate risk to a position of little or no importance. Finally, several other economists including Piore and Sabel (1984) have stressed the network character of entrepreneurship, a new form of entrepreneurship based on innovative activities carried out in clusters of firms. A review of the conceptual and operational definitions of entrepreneurship can be found in Bögenhold (2004).

Innovation has become a fashionable topic in modern economics, but the fundamentals of this concept date already back to Marshall (1890), who introduced the notion of industrial districts, in which a strong spatial concentration of (usually smaller) firms may be found and where each of these firms is specialised in one (or a few) elements of the production process of the main economic activity in the area concerned. This concentration is not only the consequence of market-driven economic and technological efficiency requirements, but is also anchored in the region's cultural, institutional and socio-economic value systems (such as trust, cooperation, social support systems). Industrial districts have in general major advantages, in particular, lower production costs, reduced transaction costs, rise in efficiency of production factors deployed and enhancement of dynamic efficiency (cf. Gordon and McCann, 2000; Lever, 2002; Porter, 2000). Such economic-technological clusters form the seedbed conditions for modern entrepreneurship (see Rabellotti, 1997). An extensive description and typology of regional clusters in Europe can be found in the Observatory of European SMEs (2002) in which a distinction is made into regional clusters, regional innovation network and regional innovation systems. A review of the literature on regional clusters can be found in Asheim et al. (2006).

Despite conclusion on the definition, the Schumpeterian concept of entrepreneurship remains dominant in most of the literature: the entrepreneurs as innovator and source of disequilibrium (O'Farrell, 1986; Thomas, 1987; Malecki, 1991). This corresponds to the definition of entrepreneurship proposed by the OECD (1998, p.11): "Entrepreneurs are essential agents of change in a market economy, and entrepreneurship fuels the drive for

new economic and technological opportunities and efficient resource use ... Growth is promoted when entrepreneurs accelerate the generation, dissemination and application of innovative ideas ... Not only do entrepreneurs seek to exploit business opportunities by better allocating resources, they also seek entirely new possibilities for resource use.” Entrepreneurship, defined in this broad sense, is central to regional economic development.

The OECD (1998, pp. 42-44) identifies three important characteristics of entrepreneurship that have emerged in the light of the above views. *First*, entrepreneurship involves a dynamic process in which new firms are starting up, existing firms are growing and unsuccessful ones are restructuring or closing-down. This can be thought of in terms of the Schumpeterian notion of creative destruction. The dynamic structure of this process is difficult to capture empirically, but one aspect is turbulence, the rate at which business open and close. This notion of turbulence attempts to capture the dynamic nature of entrepreneurial activity, and has the advantage of not relying on definitions of firm’s size, age or growth. One widely used indicator of turbulence is firm survival rate.

Statistics of firm births may be taken from business registers. But business registers not only include data on new start-ups, but also data which do not represent births: the relocation of an existing business into another region, and the take-over of an existing business. It is difficult to identify actual start-ups, as distinct from take-overs or relocations. Firm death statistics include similar flaws: close-downs due to the sale of business and relocation. These problems make it difficult to measure survival rates accurately. Cross-regional variation in firm survival rate, moreover, could reflect differences in cyclical positions, since firm creation and destruction are sensitive to the business cycle. This complicates interregional comparisons.

A *second* characteristic of entrepreneurship is that – to the extent that it implies control of the process by the entrepreneur-owner – it tends to be identified with small business where the owner(s) and manager(s) are the same. One widely used measure of the extent of the combination of entrepreneurship and ownership is the self-employment or business ownership rate (Verheul et al., 2002). The term self-employment refers to individuals who provide employment for themselves as business owners rather than seeking a paid job. But the entrepreneur is more than self-employed as emphasised by Kent (1984, p.4): “Those who start businesses solely as an alternative to wage employment do not participate in the entrepreneurial event. Entrepreneurship requires the element of growth that leads to innovation, job-creation, and economic expansion”. Thus, not all small firms are entrepreneurship, but most entrepreneurship may be found in small firms (O’Farrell, 1986). This interpretation is supported by the long-standing

observation that innovations – especially more radical ones – are more likely to originate in small firms (Malecki, 1991).

Finally, entrepreneurship entails innovation. This view stems from Schumpeter's (1934) suggestion that entrepreneurial innovation is the essence of capitalism and its process of creative destruction embodied in new products, new production processes and new forms of organisation. Some technological developments, such as microelectronics and more recently biotechnology, have provided numerous opportunities for innovation and for new firms starting up and new industries to appear (Malecki, 1997a).

One measure of innovative activities is the output of the knowledge production process measured in terms of patent applications. But innovation is a phenomenon that is difficult to capture empirically. Patent-related measures have two important limitations (see Fischer, Scherngell and Jansenberger, 2006). *First*, the range of patentable inventions constitutes only a subset of all research and development outcomes, and *second*, patenting is a strategic decision and, thus, not all patentable inventions are actually patented. As to the first limitation, purely scientific advances devoid of immediate applicability as well as incremental technological improvements, which are too trite to pass for discrete, codifiable inventions are not patentable. The second limitation is rooted in the fact that it may be optimal for firms *not* to apply for patents even though their inventions would satisfy the criteria for patentability. Therefore, patentability requirements and incentives to refrain from patenting limit the measurement based on patent data. R&D-related data, while important, relate to the input of the knowledge production process, as opposed to innovations achieved.

In general, entrepreneurs may be seen as economic change actors in an uncertain and risky business environment. Their decisions lead to spatial dynamics and are driven by dynamic efficiency objectives in which new and creative combination of action are looked for. Under such conditions the entrepreneurial environment is excessively important: open information exchange, face-to-face interaction, presence of knowledge centres and R&D facilities, skilled labour force, trust and solid codes of conduct etc. (see Audretsch and Feldman, 1996; Feldman, 2000). Such factors constitute the incubation conditions for creative action in which risk-taking is an interesting option. Knowledge spillovers are then an important condition for accelerated economic development in a competitive space-economy (see e.g., Acs et al, 2002; de Groot et al., 2004; Nijkamp et al., 2006). Especially in a major economic agglomeration with a great diversity of activities we may observe a fluidity of information and knowledge among key actors who all benefit from the spillovers in a geographic cluster of activities. Collective learning processes and individual competitive advantages seem to reinforce each other in such a creative seedbed environment. This complex set of background conditions make it very hard to come up with an unambiguous and conclusive (i.e.,

measurable) definition of entrepreneurship, as the nature and creativeness of an entrepreneur is determined by the institutional context, the learning constellation of regions and Marshallian externalities.

In conclusion, there is no generally accepted definition of entrepreneurship. This reflects the fact that entrepreneurship is an elusive, multidimensional concept. It is hard to measure precisely how much entrepreneurship is taking place in a regional economy. This is difficult in part because there is no agreement on what would be appropriate and reliable indicators. Some emphasise firm start-ups and closures as an indicator of willingness to engage in risk taking activity and capacity to innovate, and as an indicator of the ease with which resources are able to move quickly from one activity to another. Others focus on small and medium sized enterprises where the owner(s) and manager(s) are the same. Still others associate entrepreneurship with the development of high-technology industries (OECD, 1998). None of these approaches, however, is able to provide a complete picture of the state of entrepreneurship in a regional economy. While measures of small and especially new firm development are often used as indicators of entrepreneurial activity, entrepreneurship is also critical to the maintenance of business efficiency and competitiveness in larger and longer established businesses.

3 Determinants of Entrepreneurship

Regional development is a dynamic phenomenon with a permanent change in business activities. This change may be caused by innovation, by decline and by the birth and death of firms. The development of the SME sector plays a critical role in spatial dynamics, as many forms of creative entrepreneurship are found in this sector. Clearly, the regional system (education, social support system, culture, accessibility etc.) plays an important role in the changing conditions for entrepreneurship. Entrepreneurial adjustment patterns are thus of decisive importance for convergence or divergence patterns in regional systems. But it remains a fundamental question: which are the drivers of new business investments and new entrepreneurial modes of operation?

The entrepreneurial event takes shape through the interaction of two sets of factors: personal (micro) factors and environmental (macro) factors. Much of the literature on entrepreneurship has focused on the micro factors, the characteristics of an individual to become an entrepreneur and to start a new firm. These studies focus on the role of factors such as personality, educational attainment and/or ethnic origin (Lee, Florida and Acs, 2004). Personality studies have found that entrepreneurship is associated with characteristics such as alertness to business opportunities, entrepreneurial vision and proactivity (see Chell, Hawarth and Brearly, 1991). Research on personality, moreover,

found that entrepreneurs exhibit greater individualism than non-entrepreneurs do (McGrath, MacMillan and Scheinberg, 1992).

Monetary reward is certainly an important driver to entrepreneurship. But it is not always the prime motivation for opening up a business. Other aspects, including the desire for independence, self-realisation etc. often shape the entrepreneurial event. Robert and Wainer (1971) did not find motivational traits as these, but suggested that family background and educational attainment are most important, especially when one's father was an entrepreneur.

Studies of entrepreneurs in the United States show that the typical entrepreneur is someone in its mid-thirties to mid-forties who has worked for two or three well established firms and decides to establish a business, often drawing directly on the skills and experience acquired in previous employment. There is a steady flow of people in the US back and forth between self-employment and salaried employment. If a business venture fails, they can reasonably easily get another job. This is much less the case in Europe because of higher unemployment, some bias against employing older workers or the availability of early retirement (OECD, 1998).

Much of the standard research on entrepreneurship neglects the environment in which the entrepreneurial event takes place. Other more recent research, most notably Malecki (1997a), stresses the crucial role of the entrepreneurial environment for the entrepreneurial event. The meaning of the notion environment goes here well beyond that typically used in organisation theory, but reflects the broader view including social, economic, market, political and infrastructure dimensions of environmental munificence (Specht, 1993; Malecki, 1997a).

Roberts (1991) emphasises aspects of local culture and attributes as critical to building a local environment that fosters entrepreneurship. Even though cultural attitudes are formed through complex processes that are not well understood, it is a generally accepted view that cultural factors affect the way in which business is done. Such factors, for example, influence the willingness to co-operate with others and may reinforce trust and personal reputation that can reduce transaction costs in doing business. Conversely, an environment characterised by mistrust may oblige entrepreneurs to spend time and money to protect against the potentially opportunistic behaviour of those with whom they work. This may deter some of entrepreneurial activity (OECD, 1998). But there has been little research analysing systematically the impact of trust/mistrust on entrepreneurship.

High levels of entrepreneurial activity are often ascribed to cultural attributes. Culture, indeed, seems to play a critical role in determining the level of entrepreneurship within

a region. Other things being equal, an environment in which entrepreneurship is esteemed and in which stigma does not attach to legitimate business failure will almost certainly be conducive to entrepreneurship. In the US the strong pro-entrepreneurial culture has assisted to shape institutional characteristics of the economy that facilitates business start-up, reward firms based on their economic efficiency and allow low-cost exit for entrepreneurs who succeed, fail or simply want to move on to a new venture. A further striking aspect of the US entrepreneurial environment is the ample availability of risk capital and generally well-functioning market mechanisms for allocating this efficiently across a wide range of size, risk and return configurations (OECD, 1998).

The key aspect of favourable entrepreneurial environments, however, is – as emphasised by Malecki (1997a) – thriving networks of entrepreneurs (see Section 5 for further details), other firms and institutions, providing capital, information and other forms of support. The theoretical notion of the *milieu* introduced by the GREMI group (Groupement de Recherche Européen sur les Milieux Innovateurs) epitomises these characteristics (see Maillat, 1995). Entrepreneurial development is most likely to be successful in larger urban regions, especially in metropolitan regions, where innovativeness, an entrepreneurial climate and business opportunities are relative abundant (Malecki, 1997a).

It should be added that knowledge-based regional innovation policies may have two constituents; viz. (i) tailor-made support measures that enhance the micro innovative potential of firms through the use of loans, start-up subsidies, tax credits or favourable venture capital, and (ii) generic support research and R&D systems, innovation labs, university educations and public-private cooperation. A further exposition on these various policies can be found in the innovation systems literature (see Lundvall, 1992; and Nelson, 1993).

4 Spatial Aspects of Entrepreneurship

Entrepreneurship has in the past decade received a prominent position in economic theory, as it is increasingly recognised that the entrepreneurship plays a critical role in economic growth. In contrast to traditional growth theory where technological progress and innovation was regarded as an exogenous force ('manna from heaven'), modern endogenous growth theory takes for granted that innovation and entrepreneurship are endogenous forces that are driven by various actors in the economic systems and which can be influenced by smart public policy. This new theoretical framework places much emphasis on critical success factors such as competition, vested interests, R&D, knowledge spillovers, human capital, industrial culture and entrepreneurial ability (see for an overview Capello, 2007).

In the literature on technological innovation and regional growth – following the rise of the new growth theory – three major drivers of growth were outlined: the knowledge base, innovative culture and action, and public infrastructure.

Entrepreneurship does not take place in a wonderland of no spatial dimensions, but is deeply rooted in supporting geographic locational support conditions (such as favourable urban incubation systems, venture capital support conditions, accessibility and openness of urban systems, diversity and stress conditions in the urban environment, heterogeneous and highly skilled labour force, communication and information infrastructures, collective learning mechanisms, etc.). With the advent of the modern sophisticated communication and network structures, the action radius of entrepreneurs has significantly increased (see e.g. Reggiani and Nijkamp, 2006). Consequently, the geography of entrepreneurship and innovation has become an important field of research in modern regional economics, in which the dynamics of firms is receiving major attention.

The birth, growth, contraction and death process of enterprises has become an important field of research in so-called firm demographics (see van Wissen, 2000). This new field of research is concerned with the analysis of the spatial-temporal change pattern of firms from a behavioural-analytical perspective (see Nelson and Winter, 1982). Recent interesting studies in this field can be found inter alia in Brüderl and Schussler (1990); Siegfried and Evans (1994) and Carroll and Hannan (2000). Many studies on growth processes of firms originate from industrial economics and management disciplines (e.g. Stinchcombe, MacDill and Walker, 1968; Evans, 1987; Gertler, 1988; Hayter, 1997; or Caves, 1998).

The roots of this new approach can be found in the 1980s when in a period of economic recession much attention was given to the birth of new firms. From a regional economic perspective much research was undertaken on the geographical differentiation in the birth and growth process of new firms (see, for example, Keeble and Wever, 1986; Oakey, 1993; Storey, 1994; Suarez-Villa, 1996; and Sutton, 1998). The predominant focus on new firm formation tended to neglect the spatio-temporal dynamics of incumbent firms, in particular the way they survive, grow or decline. From that perspective also the role of the adoption of new technology had to receive due attention (see, for example, Abernathy, Clark and Kantrow, 1983; Storper and Scott, 1989; Davelaar, 1991; Pettigrew and Whipp, 1991; and Nooteboom, 1993). This has also prompted several studies on the life cycles of firms (in particular, with respect to their competitive performance, product differentiation, spatial relocation, organisational restructuring, etc).

There are various reasons why of all types of firm dynamics, new firm formation has attracted much concern (see van Geenhuizen and Nijkamp, 1995). Perhaps most significant is the fact that new firms provide new jobs. A second reason is that new firms are often involved in the introduction of new products and processes in the market. Accordingly, they may provide a major challenge to established firms and encourage them to improve their product quality and service or to reduce prices. On the other hand, it should be recognised that newly established firms face relatively large risks, due to lack of organisational experience and cohesion. As a consequence, the death rate among start-ups is relatively high and tends to decrease over time. Many entrepreneurs appear to die at a young age. It is clear that successful new enterprises contribute significantly to the economy and employment in the region concerned. There is, however, usually a large sectoral and geographical variation among the success or survival rates of new entrepreneurs (see Acs, 1994).

Empirical research has shown that in most cases enterprises change their strategies (products, markets, etc.) in an incremental way. From historical research it appears that radical adjustments do take place, but occur rather infrequently (Mintzberg, 1978). In evolutionary economics it is emphasised that organisations develop, stabilise and follow routines. These routines may change over time, but in the short run they function as stable carriers for knowledge and experience. This causes a certain degree of ‘inertia’. Related to the latter point is the core concept of search behaviour. Organisations are not invariant, but change as a result of a search for new solutions when older ones fail to work. Search behaviour follows routines, for example, based upon perceptions ‘coloured’ by the previous situation and biases in information processing (see also van Geenhuizen and Nijkamp, 1995).

The study of the development trajectories of individual firms from a spatio-temporal perspective is sometimes called ‘company life history analysis’ (see van Geenhuizen, 1993). It mainly uses a case study approach and aims to trace and explain the evolution of firms over a longer period. Particular attention is then given to entrepreneurial motives for corporate change at the micro level. Factors to be considered are *inter alia* the business environment, leadership, links between strategic and operational change, human resource management and coherence in management (see also Pettigrew and Whipp, 1991). Information acquisition, e.g. through participation in networks of industries, is of course also an important element to be considered. In this context, also the local ‘milieu’ may play an important role.

It is a widely held belief that metropolitan environments offer favourable incubator conditions for creative entrepreneurship, as in this setting the conditions for proper human resource management (e.g. by means of specialised training and educational institutes) and labour recruitment are most favourable (see, for example, Thompson,

1968; Leone and Struyck, 1976; Pred, 1977; Davelaar, 1991; or Lagendijk and Oinas, 2005). But it should be recognised that various non-metropolitan areas also do offer favourable seedbed conditions to the management of corporate change. The reason is that in many non-metropolitan areas the information needs are met in localised learning mechanisms, based on a dynamic territorial interplay between actors in a coherent production system, local culture, tradition and experiences (see Camagni, 1991; Storper, 1992, 1993).

This view comes close to the one which puts a strong emphasis on the trend for localisation in less central areas where doing business is a final resort or a survival strategy. Advocates of the latter idea adhere to a vertically disintegrated and locationally fixed production, based on a shift to flexible specialisation. Some empirical evidence on non-urban seedbeds is found in high-technology regions such as Silicon Valley, Boston, the M4 Corridor, and in semi-rural areas such as the Third Italy. Although the success of economic restructuring in these regions – as a result of many high-tech start-up firms – is, without doubt, the pervasiveness of the trend for flexible specialisation, concomitant localisation is not sufficiently proven (see Gertler, 1988; van Geenhuizen and van der Knaap, 1994). Aside from a trend towards localisation there is a trend towards globalisation, associated with the growing influence of multinational corporations and their global networking with smaller firms (see Amin, 1993).

In the light of the previous observations it may be argued that modern entrepreneurship is based on associated skills of a varied nature. An entrepreneur is certainly an opportunity seeker, but in so doing he needs to have an open eye on a rapidly changing external environment. As a consequence, firm demography is a multidimensional field of research in which psychology, sociology, marketing, political science, economics, finance and management come together. A demographic approach to entrepreneurship may unravel various components of the spatio-temporal dynamics of both existing and new firms. In-depth case study research as advocated in company life history analysis is certainly necessary to identify motives and barriers concerning successful entrepreneurship, but there is also a clear need for more analytical comparative research leading to research synthesis and transferable lessons.

An interesting example of the latter type of research approach can be found in a recent study by Breschi (2000), who conducted a cross-sector analysis of the geography of innovative activities. Using the evolutionary concept of a technological regime he was able to identify the background factors of variations in spatial patterns of innovations, viz. knowledge base, technological opportunities, appropriability conditions and cumulativeness of technical advances. Undertaking more of such studies might advance the idea that geography counts in a modern entrepreneurial age. Cities offer important seedbed conditions for modern entrepreneurship in an open network economy, but this

role is by no means exclusive. We observe at the same time local niches or shells in isolated areas which offer due protection or incubation for creative entrepreneurial abilities. Important stimulating factors may be: the presence of training and educational facilities; an open business culture; venture capital; public support; local suppliers and subcontractors; and so forth. Consequently, the geographic landscape of modern entrepreneurship is varied and calls for intensified research efforts aimed at more synthesis.

The complexity of the determinants and implications of entrepreneurial behaviour in space and time calls for sophisticated modelling efforts (see also Bertuglia et al., 1997). In the statistical analysis of entrepreneurial behaviour one may distinguish two strands of research, viz. a macro and a micro approach. In the macro approach the attention is focussed on statistical patterns and correlations between geographic location factors, entrepreneurial climate, innovative seedbed conditions, governmental support mechanisms etc. on the one hand and entrepreneurial activity (e.g., investment, product choice, industrial organisation) on the other hand. Numerous studies based on aggregate figures have been performed in the past decades (see e.g., Audretsch et al., 2007; Blanchflower et al., 2001; Santarelli, 2006; Lundstrom and Stevenson, 2005). In the micro approach the individual motives, behavioural drivers (such as image or recognition) or cognitive determinants are analysed. This type of research is often based on survey questionnaires or interviews. There is also an abundance of literature in this field, although the spatial dimensions have been given less attention thus far (see e.g., Acs and Audretsch, 2003; Axtell et al., 2000; Baumol, 1990; Smith, 2002; Ehigie and Akpan, 2004; Campbell et al., 1996; Miron et al., 2004; Getz and Robinson, 2003).

A final remark is in order here. Entrepreneurship is not just a commercial business activity, but is often prompted by new knowledge and R&D (see also Acs, 2002; Boekema et al., 2000; Peneder, 2001). This positions universities often in the centre of creative entrepreneurship. Shane (2004) has rightly argued that academic entrepreneurship – and its related university spin-off companies – play a critical role in the commercialisation of university technology and wealth creation. The critical success factors for academic spin-offs are: the university and societal environment, the technology developed at universities, the industries favoured by these spin-offs, and the human capital involved. Thus, research and higher education are key instruments for modern entrepreneurship in knowledge-intensive regions.

5 Entrepreneurship and Networks

Entrepreneurship means also the management of business network constellations. An interesting and rather comprehensive review of the relationship between

entrepreneurship and network involvement has been given by Malecki (1997b). The local environment (including its culture, knowledge base and business attitude) appears to act as a critical success factor for new forms of entrepreneurship, a finding also obtained by Camagni (1991). Apparently, the local 'milieu' offers various types of networks which tend to encourage the 'entrepreneurial act' (see Shapero, 1984).

It should be emphasised that the chain entrepreneurship – competition – innovation – growth is not a rectilinear one. Innovation is a critical factor that functions in an open multi-actor system with concurrent phases of decisions and plan implementations, where the demand side (i.e., the customer) is the driving force (see Prahalad and Ramaswamy, 2004). Innovation policy at the firm level with various risks bears increasingly a resemblance to a smart portfolio management. But in the particular case of innovation a balance has to be found between uncertain exploration and risky exploitation (March, 1991). Entrepreneurs are the foundation stones of the innovation process, as they have to create new combinations of people and products, through the creation of idea generators, of product champions, of proper support, of proper support systems and mentors, of venture mechanisms and of effective gatekeepers (see also Katz, 2003).

In the Schumpeterian view the entrepreneur is seeking for new combinations while destroying in a creative way existing constellations. This highly risk-taking behaviour, however, can be ameliorated by externalising some of the risks through participation or involvement in local or broader industrial networks. In general, the urban climate offers many possibilities for strategic network involvement, either material or virtual. In this way, the entrepreneur tends to become an organiser of change. The early urban economics literature (Hoover and Vernon, 1959) has already spelt out the great potential of urban industrial districts for creative entrepreneurship (for a review of the incubation literature, see Davelaar, 1991). Also in the sociologically-oriented writings of Jacobs (1961), we observe similar arguments. Apparently, urban modes of life create scale economies which favour the rise of new enterprises. To some extent, this idea was already propagated by Marshall (1890), who introduced the concept of industrial districts which generated an enormous economic growth potential (see also Amin and Thrift, 1992; Markusen, 1996; Paci and Usai, 2000). In general, vertical disintegration in combination with network strategies at a local level may induce a resurgence of Marshallian districts as self-contained local networks of creative economic development.

The modern information and communication technology (ICT) is a center-piece in the rise of both local and global networks. ICT does not only induce faster and more reliable communications, but prompts also a change in firm interaction, management practice, labour acquisition and spatial structure of entrepreneurship (see Bethe et al.,

2005). In addition, ICT favours both business-to-business commerce and business-to-consumer commerce. The use of Internet and e-commerce mean a significant and historically unprecedented rise in productivity, a phenomenon that can be ascribed to network externality theory, which explains increasing returns, first-mover advantages and coordination advantages (see e.g. Economides, 1997; Wigand, 1997; van Geenhuizen and Nijkamp, 2005). It is clear that creative entrepreneurship finds nowadays its roots in the modern ICT sector.

But it should be recognised that networking as a business strategy requires investments in social communication, informal bonds, training and education. To build up and to operate effectively in networks requires time and effort. Furthermore, networking may be a desirable or necessary condition, but it is by no means sufficient to ensure good entrepreneurship. And last but not least, network behaviour may also stimulate uniformity, which may contradict the entrepreneurial spirit.

Networks may, in general, relate to physical configurations (such as aviation networks, road networks, railway networks or telecommunication networks) or to virtual networks (such as industrial clubs, knowledge networks or information networks). Many networks may have a local character, but may also extend towards global levels. Such networks may favour industrial diversity, entrepreneurial spirit and resource mobilisation (see also Andersson, 1985; and van de Ven, 1993). In general, local inter-firm networks may be seen as supporting mechanisms for new forms of creative entrepreneurship (especially among high-tech start-up firms), as such networks are a blend of openness (necessary for competition) and protection (needed for an 'infant industry'). It may be interesting to quote here the final conclusions of Malecki (1997b, p. 98): "Thus, it is difficult for any 'recipe' from one place to work when transplanted into another place, with its unique culture, traditions, capabilities, and networks".

From the perspective of a business environment, information and knowledge is a *sine qua non* for entrepreneurial success, not only for large-scale companies but also for SMEs. Malecki and Poehling (1999), have given a very valuable review of the literature on this issue; learning-by-doing, supported by inter-firm network collaboration, enhances the competitive potential of new firm initiatives. They observe a variety of network configurations, such as suppliers or customer networks, local networks of neighbouring firms, professional networks and knowledge networks, which all may contribute to a better entrepreneurial performance. Empirical research in this area, however, is still scarce and there would be scope for more systematic comparative investigations into the knowledge drivers of modern entrepreneurship. It is certainly true that information and knowledge is an important asset in an enterprise, but the economic evaluation of such knowledge (e.g. as a private good or a public good with a

non-rivalry character) needs to be studied more thoroughly (see Shane and Venkataraman, 2000).

An interesting illustration of the importance of local networks for new firm formation can be found in the literature on ethnic entrepreneurship (see Waldinger, 1996). Many cities in a modern industrialised world are confronted with a large influx of foreign migrants (see, for example, McManus, 1990; Borjas, 1992, 1995; Brezis and Temin, 1997; Gorter, Nijkamp and Poot, 1998). The socioeconomic problems involved have created an enormous tension and have prompted many policy initiatives on housing, job creation, education, etc. But the successes of such policies have not yet been impressive. The seedbed conditions for active economic participation are often weak, as a result of low levels of skill, language deficiencies, cultural gaps and stigmatisation. One of the more recent promising efforts has been to favour ethnic entrepreneurship, so that through a system of self-employment socio-cultural minorities might be able to improve their less favoured position. Ethnic entrepreneurship has different appearances, e.g. production for the indigenous ethnic market or low skilled activities, but increasingly we see also an upgrading of the ethnic production sector (e.g. shops, software firms, consultancy).

In a recent survey study, van Delft, Gorter and Nijkamp (2000) have demonstrated that the access to and use of local support networks is a critical success factor for various urban policy programmes addressing the new immigrants. Such networks may relate to socio-economic support, provision of venture capital or access to the urban community at large. The importance of social bonds and kinship relationships has also been emphasised by several other authors (for instance, Boyd, 1989; Chiswick and Miller, 1996; Borooah and Hart, 1999). In general, such networks appear to create various externalities in terms of entrepreneurial spirit, search for opportunities, self-organisation and self-education, and business information and access to local markets.

But it is noteworthy that such network connections are geared toward the geographical space in which ethnic entrepreneurs operate. It should be added that in most cities ethnic networks are not uniform, but reflect local cultures from the country of origin. Many ethnic entrepreneurs operate in volatile markets and, although network participation is needed to cope with many market uncertainties, business or social networks are usually not sufficient to survive in a competitive environment (see Barrett, Jones and McEvoy, 1996). There is a need for more thorough empirical research on the motives and performance of ethnic entrepreneurs (see also Masurel et al., 2002). The ethnic entrepreneur as a network manager is still a concept that has not become deeply rooted in the ethnic business environment.

6 Concluding Remarks

Entrepreneurship and regional development prompt a rich variety of research questions to regional scientists. It is a domain where industrial organisation, cultural geography, location theory, business economies and technology form an intertwined nexus. From a macro or global perspective, the region is a strategic niche in a global development. But from a micro perspective, the region is shaped by innovative actions of risk-seeking entrepreneurs. Competition, trust, network organisation and public policy are ingredients for win-win situations at local level.

Our review of this complex field has clearly demonstrated the linkages of the theme of 'entrepreneurship and regional development' to other research domains, such as network theory, spatial externalities, cultural-behavioural theory, innovation theory and endogenous growth theory. From a dynamic entrepreneurial and regional growth theory, the interwoven connection of entrepreneurial life cycles, industrial life cycles and (multi)regional life cycles is a fascinating research issue, not only from a theoretical viewpoint, but also from an applied modelling perspective. A particularly fascinating and policy-relevant question is then how knowledge investments and spillovers are related to dynamic spatial processes. It goes without saying that in this field still a wealth of research questions and answers are waiting to be tackled. From this perspective, there is a great need for creative combined micro-meso-macro growth analyses at a regional level. Quantitative modelling has so far not kept pace with the research challenges in the past decade.

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